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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,082	01/07/2002	Christopher Michael Abernathy	AUS920010807US1	6560

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EXAMINER

CHEN, TSE W

ART UNIT	PAPER NUMBER
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2116

DATE MAILED: 03/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/042,082

Applicant(s)

ABERNATHY ET AL.

Examiner

Tse Chen

Art Unit

2116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 2116

DETAILED ACTION

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Amendment dated February 28, 2005.

2. Claims 1-17 are presented for examination.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 11 and 17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant did not disclose the subject matter of “detecting when valid instructions are not being executed by one or more stages by control logic” in the original specification. Therefore, said subject matter is considered new and not eligible for prosecution in this application. Accordingly, the dependent claims 12-16 have not been further treated on the merits in the instant Office Action.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the

Art Unit: 2116

international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-3, 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Fletcher et al., US Patent 6611920, hereinafter Fletcher.

7. In re claim 1, Fletcher discloses a microprocessor [integrated circuit] configured for executing at least one instruction, the microprocessor having a main processor clock [fig.3; abstract], the microprocessor comprising:

- A first stage [310.1] having one or more storage components [inherently, a storage component in the broadest interpretation is needed to receive data for processing] configured for storing operand data of the at least one instruction, the first stage being clocked by at least a first clock [320.1] derived from the main processor clock [col.4, ll.6-26].
- A first combinatorial logic [310.1] connected to the first stage for receiving the operand data from the first stage and configured for processing the operand data and generating first output data, wherein the first clock is operational only during a first period of time when the operand data is processed by the first combinatorial logic [col.4, ll.1-60].
- A second stage [310.2] of one or more storage components [inherently, a storage component in the broadest interpretation is needed to receive data for processing] configured for storing the first output data, the second stage being clocked by at least a second clock derived from the main processor clock [col.4, ll.6-26].
- Control logic [e.g., scheduler] that is at least configured to generate at least one instruction-valid control bit [valid, enable signal] [col.3, ll.19-25, ll.53-67], wherein the at least one instruction-valid control bit is configured to disable a first

Art Unit: 2116

clock derived from the main processor clock if a first stage is unused *or* to disable a second clock derived from the main processor clock if a second stage is unused [col.4, ll.48-53; deactivate valid signal would deactivate the clock when first stage is not to be used].

- A second combinatorial logic [310.2] connected to the second stage for receiving the first output data from the second stage and configured for processing the first output data and generating second output data, wherein the second clock is operational only during a second period of time when the first output data is processed by the second combinatorial logic [col.4, ll.1-60].

8. As to claim 2, Fletcher discloses the microprocessor comprising:

- A first local clock buffer [320.1] connected to the first stage for providing at least the first clock to the first stage only during the first period of time [col.4, ll.1-60].
- A second local clock buffer [320.2] configured for generating the second clock and connected to the second stage for providing at least the second clock to the second stage only during the second period of time [col.4, ll.1-60].

9. As to claim 3, Fletcher discloses each and every limitation of the claim as discussed above in reference to claim 2, including:

- A dynamic clock-control unit [330.1 and 340.1] connected to at least the first local clock buffer for providing a first control signal [output of 330.1] to at least the first local clock buffer and configured for generating the first control signal, the first control signal enabling the first clock signal to be operational only during the first period of time [col.4, ll.15-60].

Art Unit: 2116

10. As to claim 8, Fletcher discloses the microprocessor wherein the second period of time is automatically determined by delaying the first period of time by one cycle of the main processor clock [col.4, ll.27-57].

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 4-7, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher as applied to claim 1 above, and further in view of Sutherland, US Patent 6304125.

13. In re claim 4, Fletcher discloses each and every limitation of the claim as discussed above in reference to claim 1. Fletcher did not discuss the details of data origination or destination.

14. Sutherland discloses a microprocessor [abstract], comprising an integrated storage component [12] configured for storing the operand data, the integrated storage component being connected to the first stage [s1] for providing the operand data to the first stage and being connected to the second combinatorial logic [s5] for receiving the second output data from the second combinatorial logic [fig.1; col.3, l.55 – col.4, l.17].

15. It would have been obvious to one of ordinary skill in the art, having the teachings of Fletcher and Sutherland before him at the time the invention was made, to modify the microprocessor taught by Fletcher to include the integrated storage component taught by Sutherland, as the integrated storage component taught by Sutherland is a well known

Art Unit: 2116

component suitable for use with the microprocessor of Fletcher. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to store operands before and after pipeline processing [Sutherland: col.3, 1.55 – col.4, 1.17].

16. As to claim 5, Fletcher and Sutherland disclose each and every limitation of the claim as discussed above in reference to claims 2 and 4.

17. As to claim 6, Sutherland discloses the microprocessor wherein the first stage comprises one or more latches, and wherein the second stage comprises one or more latches [col.3, 1.55 – col.4, 1.17].

18. As to claim 7, Sutherland discloses a microprocessor [abstract], comprising an integrated storage component [12] configured for storing the operand data, the integrated storage component being connected to the first stage [s1] for providing the operand data to the first stage and being connected to the second combinatorial logic [s5] for receiving the second output data from the second combinatorial logic, wherein the integrated storage component comprises an array [register file] [fig.1; col.3, 1.55 – col.4, 1.17].

19. As to claim 9, Fletcher and Sutherland disclose each and every limitation of the claim as discussed above in reference to claims 3 and 4.

20. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fletcher as applied to claim 1 above, and further in view of Kopser et al., US Patent 6629250, hereinafter Kopser.

21. Fletcher taught each and every limitation of the claim, as discussed above in reference to claim 1. Fletcher did not discuss the details of the stage components.

22. Kopser discloses a storage component comprising a master latch [20] configured for storing an operand data and being clocked by a first master clock [ckm] derived from a first clock [ck] and a slave latch [22] connected to the master latch for receiving the

Art Unit: 2116

operand data [dm] from the master latch and storing the operand data, the slave latch being configured for being clocked by a first slave clock [36] derived from the first clock [fig.2; col.3, l.31 – col.4, l.4].

23. It would have been obvious to one of ordinary skill in the art, having the teachings of Fletcher and Kopser before him at the time the invention was made, to modify the microprocessor taught by Fletcher to include the storage component taught by Kopser, in order to obtain the microprocessor wherein each storage component in the first stage comprises a master latch configured for storing the operand data and being clocked by a first master clock derived from the first clock and a slave latch connected to the master latch for receiving the operand data from the master latch and storing the operand data, the slave latch being configured for being clocked by a first slave clock derived from the first clock. One of ordinary skill in the art would have been motivated to make such a combination as it provides a way to ensure synchronization of data transfer [Kopser: col.1, l.14 – col.2, l.43].

Response to Arguments

24. Applicant's arguments filed February 28, 2005 have been fully considered but they are not persuasive.

25. Regarding claim1, Applicant cited page 6, lines 10-15 of the original application to support the claim that “allows the present invention ... to have increase flexibility so that data propagation can be terminated at any time as well as allowing a clocking signal to be provided at each stage”. However, the amended claim 1 is not sufficiently clear in asserting the distinguishing feature that can terminate data propagation at any time. In essence, a careful reading of the amended claim 1 still renders the claim broad enough to not overcome the cited portions of Fletcher as discussed above in the rejections.

Art Unit: 2116

Examiner reminds Applicant that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In any case, Examiner has provided several additionally cited references below that disclose Applicant's cited distinguishing features so Applicant may choose to focus future amendments on other areas.

26. Regarding claim 11, Applicant did not cite any support from the original specification for “*detecting when valid instructions are not being executed* by one or more stages by control logic”. Applicant's claimed invention appears to deal with the determination of valid instructions that *are to be* executed [i.e., anticipation], not the detection of when valid instructions *are not being* executed [i.e., verification].

27. All other claims were not argued separately.

Conclusion

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Feierbach, US Publication 20020138777, discloses a pipeline processor that permits a clocking signal to be provided at each stage.
- Khan et al., US Publication 20020116181, discloses a pipeline processor that permits data propagation to be terminated at any time.

29. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


Art Unit: 2116

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tse Chen whose telephone number is (571) 272-3672. The examiner can normally be reached on Monday - Friday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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SUPERVISORY PATENT EXAMINER
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Tse Chen
March 28, 2005